STEREO AMPLIFIER

A-27

OPERATING INSTRUCTIONS

S
S/G

NOTE

This amplifier provides a line voltage selector switch on the rear panel, so please confirm the setting of the switch before turning on the power switch, referring to the section "Adjusting the Line Voltage Selector Switch" on page 15.

PIONEER®

INSTALLATION PRECAUTIONS

The A-27 weighs a full 26kg and so be sure to install it in a location which can support heavy weights. Also, take care when transporting the A-27 from one place to another and when otherwise handling it.

Don't put anything on the top of the A-27 because a high-power amplifier will produce a lot of heat. Also leave sufficient space around the amplifier for adequate ventilation.

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FEATURES

Power Amplifier with a Magni-wide Power Range, Low Distortion and Continuous Power Output of 120W Per Channel

The A-27 stereo amplifier incorporates a current mirror load cascade connected to a single-stage differential amplifier with dual transistors, a Class AB triple-stage Darlington circuit, a parallel push-pull circuit and a pure complementary OCL circuit.

Pioneer's newly developed Ring Emitter Transistors (RETs) with excellent high-frequency-range characteristics at high-output power ratings are adopted for the Class AB power stage. These help the amplifier display an ultra-wide power range and deliver a

Continuous Power Output of 120 watts* per channel, min., at 8 ohms from 5 Hertz to 30,000 Hertz with no more than 0.012% total harmonic distortion.

The power amplifier is configured as a DC power amplifier with the capacitors removed from the NFB circuit for a superbly low distortion all the way from very faint outputs up to full power.

In the output range which is actually used (3W/8 ohms), the power amplifier works as a Class A model, enabling you to enjoy music delivered by a Class A amplifier with magnificient linearity.

Independent Left and Right Power Supplies that Back Up the High and Stable Power Output

The large-sized transformers with their superb regulation packing quite a punch, and the large-capacity (18,000μF) electrolytic capacitors (two per channel) are featured in the independently positioned dual power supply circuits with separate power transformer windings to provide power for the left and right channels. These power supplies not only deliver a stable output of power at all times but they also help give low-frequency-range sound reproduction with an unusually singular regulation and damping even during high outputs.

The primaries of the power transformers contain inrush-current suppressors which serve to suppress high-value inrush currents when the power switch is thrown to ON. These circuits reduce the load on each of the parts that make up the dynamic power supplies, and also successfully enhance the degree of reliability.

Equalizer Amplifier with Low Distortion and High Signal-to-noise Features

The first stage employs a differential amplifier that features a newly developed super-low-noise dual FET (field effect transistor) and that is also cascade-connected. The next stage is connected to a Darlington circuit, and the final stage employs a pure complementary SEPP circuit. These features yield a signal-to-noise ratio of 90dB (PHONO MM), while the DC amplifier configuration with the capacitors removed from the NFB circuit serves to display improved distortion characteristics and transient response.

The equalizer elements which are designed to produce the RIAA characteristics use high-precision parts to keep the equalizer deviation between 20Hz – 20kHz down to ±0.2dB for faithful sound reproduction from records. The maximum allowable PHONO input is 300mV (1kHz) with respect to a rating of 2.5mV, which shows that there is plenty in reserve. When the music source has a high dynamic range or when a high-output cartridge is being used for the turntable, it means that you can sit back and enjoy listening to distortion-free record play.

Built-in Amplifier for High Signal-to-noise Ratio MC Cartridges

An MC amplifier which is configured as a DC amp is built into the PHONO input circuit, and the first stage incorporates a triple-stage direct-coupled Class A SEPP circuit connecting two sets of newly developed low-noise transistors (pnp and npn) in parallel. These innovations make for a superb frequency response and low distortion level, not to mention the high dynamic range and the high signal-to-noise ratio (78dB). This means that the MC cartridge can give full rein to its characteristics and also, therefore, that you listen to only the best reproduced sound from records.

Cartridge Load Selector Switches for MM Cartridges

The cartridge load (MM) selector switches on the front panel can be used to select the optimum input resistance (ohms) and capacitance (pF) in accordance with the characteristics of MM (moving magnet) cartridges. These switches are contained in the PHONO 1 and 2 input circuits.

Moreover, by selecting load resistances and capacitances which are beyond the range of those designated, it is possible to enjoy subtle variations in the sound quality of the phono cartridges.

Twin Low-Distortion Tone Controls

The A-27 power amplifier employs Pioneer's very own twin tone controls. Along with the conventional bass and treble controls, they can be used for adjusting the ultra-deep bass and the ultra-high treble independently. These are useful features since they enable you to adjust the sound quality produced by the speakers and phono cartridges, and to produce variations in the acoustics of the listening room.

Highly Reliable Protection Circuitry

The built-in protection circuitry is a combination of electronic circuits matched with relays and also high-speed over-load detection circuits. If the speaker terminals are shorted owing to defective connections or if any other unforeseen accidents should arise, these protection circuits swing into action at a moment's notice and prevent the speakers and power transistors from being damaged. In addition, there is a muting circuit that cuts out the noise produced by the on/off operation of the power switch.

Wide Variety of Accessory Mechanisms

SUBSONIC switch: This 2-stage selector (15Hz/6dB, 15Hz/12dB) filter safeguards against damage being incurred by the speakers due to harmful noise which is generated by record warp and other distortion (it is harmful even though it cannot be heard by the ear), and also against the generation of intermodulation distortion.

PHONO MM/MC switch: This is a switch used to select between MC (moving coil) cartridges and MM (moving magnet) cartridges. There is no need to change over the turntable connections every time you want to use a different cartridge.

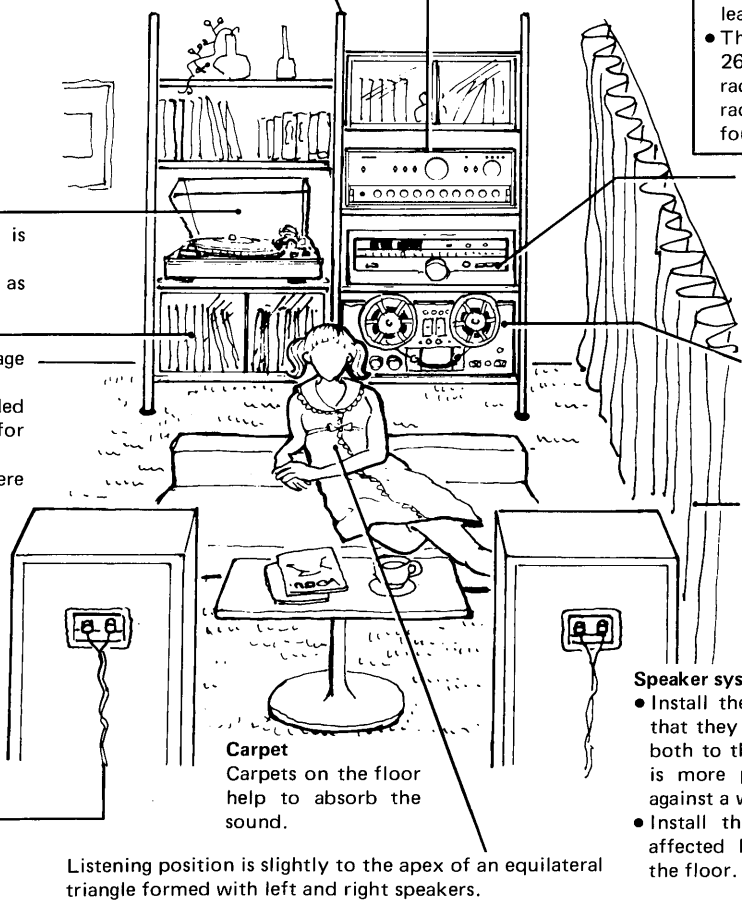
MUTING-20dB switch: This is a –20dB muting switch with two positions: NORMAL for attenuating the sound volume by 20dB and FLAT AMP BYPASS for bypassing the flat amplifier and tone control circuits. When used along with the volume control, subtle changes in the sound volume can be accomplished. In particular, when set to the BYPASS position, the equalizer amplifier and the power amplifier are coupled directly. All in all, this is a unique circuit.

Tasteful and Sophisticated Front Panel Design

The switches and knobs with their aventurine finish are shaped for easy handling while the knobs used most infrequently are housed under the glass panel. The A-27 therefore features a sophisticated design for the front panel which is crafted for tip-top functionality.

**Measured pursuant to the Federal Trade Commission's Trade Regulation rule on Power Output Claims for Amplifiers.*

STEREO SYSTEM COMPOSITION



Shelves
Make sure that the shelves are stable and fully capable of supporting heavy weights and resisting vibration.

Installing the stereo amplifier
- Choose a location where the heat will be dissipated easily.
- Do not stack another stereo component immediately above the stereo amplifier but leave a clearance of at least 10cm.
- The stereo amplifier weighs a full 26kg so make sure that the stereo rack shelf is not bent and that the rack itself is erected on a stable foundation.

Turntable
- Set the turntable so that it is not affected by vibration.
- Keep the dust cover closed as much as possible.

Audio rack
- Stack the records up for storage — do not lay them flat.
- Do not expose pre-recorded tapes near the stereo system for long-periods of time.
- Do not store the tapes anywhere near a magnetic field.

The sound quality sometimes changes depending on the position and the material of the furniture.

Tuner
- Do not make the connecting cords longer than necessary.
- Set the antenna in the direction best suited for reception.
- Use an external antenna for FM reception.

Tape deck
- Make sure you clamp the reels when using the tape deck.
- Attach the dust cover when not in use.

Thick curtains
- Use curtains to shade the stereo system from the direct rays of the sun.
- Curtains also help to reduce resonance and reverberation in the listening room.

Speaker system
- Install the speakers to the left and right so that they are subject to the same conditions both to the side and at the back. (The bass is more pronounced if you set them up against a wall.)
- Install the speakers so that they are not affected by vibration transmitted through the floor.

Carpet
Carpets on the floor help to absorb the sound.

Connecting the speakers
Use high current capacity connecting cords and do not make them longer than necessary.

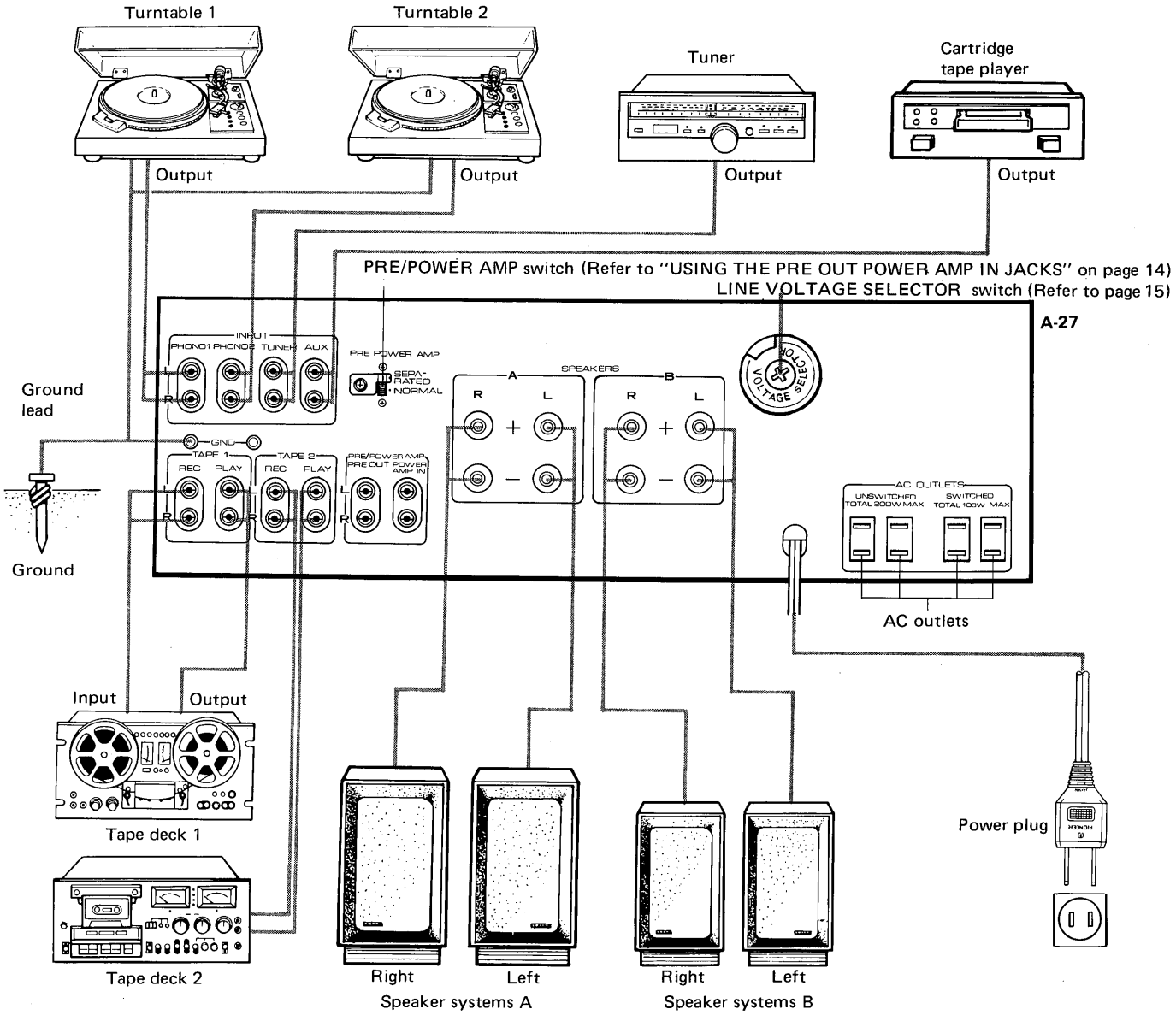
Listening position is slightly to the apex of an equilateral triangle formed with left and right speakers.

INSTALLATION CAUTIONS

To ensure the best sound quality and trouble-free operation, avoid setting up the amplifier in any of the locations described below:

Locations liable to downgrade performance and result in breakdowns	Resulting trouble
1. Locations exposed to direct sunlight, or near heaters.	1. External heat causes the performance of the electronic parts to deteriorate, and operation becomes unstable.
2. Locations with poor ventilation, with high humidity or moisture contents, or dusty locations.	2. Cause of faulty contact in input-output terminals, and rust. High humidity and a high moisture content cause deterioration in insulation. There is also the danger of current leakage and heat generation in the circuit parts. Dust or grease in the rotating parts causes them to deteriorate.
3. Locations susceptible to vibration.	3. These locations affect the precision parts adversely.
4. Locations where an AM radio or TV set is being used simultaneously.	4. Mutual interference can occur from the oscillator circuits used in these products.

CONNECTION DIAGRAM



AC OUTLETS AND POWER PLUGS

Plug the power plug of your audio components into the SWITCHED and UNSWITCHED convenience outlets.

SWITCHED . . . The power supplied through these outlets is coupled to the operation of the amplifier's POWER switch; so when the POWER switch is turned to ON, power is supplied through these outlets and when turned to OFF, power is cut off. For instance, if you connect a turntable to the outlet and keep its power switch at ON, you can turn it on and off by turning the amplifier's POWER switch on and off. The maximum power capacity which may be connected to the two SWITCHED outlets is 100W.

UNSWITCHED . . . The power is always supplied through these two outlets regardless of the position of the POWER switch. The maximum power capacity which may be connected to these two outlets is 200W.

- Never connect an iron or a toaster to these outlets.
- Do not get the power outlets and the power plugs wet or tough them with wet hands, since you may get an electric shock.

CONNECTIONS

CONNECTION NOTES

- Set the POWER switch to ON only when you have completed all the connections of the stereo system. Always set this switch to its lower position (OFF) if you want to change the connections.
- All the amplifier's jacks are aligned for easy connection in two rows: the upper row for L (left channel) and the lower row for R (right channel). Always connect L to L and R to R with the audio component output and input jacks.
- Make sure that the connections are secure. Improper connections can generate noise and cause the sound to be cut off.
- Do not switch the power on until you have completed all the connections of the whole stereo system. When changing over the connections while the system is in operation, make sure that you switch the power off first.

SPEAKER SYSTEM CONNECTION FOR YOUR AMPLIFIER

WARNING! Due to the power available at the speaker terminals (as described in our specifications), it is necessary for these instructions to be read and followed carefully in order to prevent fire and shock hazards.

The amplifier is equipped with two sets of speaker terminals (A and B). Use the A terminals for the speakers in normal use.

As shown in Fig. 1, the upper terminal (red) is positive (+), and the lower terminal (black) is the negative in each case.

In the same way, the speakers have positive and negative polarity (+ and − terminals). Be sure to connect terminals of the same polarity together (+ to +, and − to −).

NOTES:
When two sets of speaker systems are being used at the same time (A + B), please ensure that the impedance of each speaker system is not less than 8Ω. If speaker systems with impedances below 8Ω are used, the amplifier's protection circuit may operate to prevent sound being produced.

The high output power of the amplifier requires cords of ample current handling capacity (18 AWG or heavier) for connection to the speaker systems.

SPEAKER LEAD WIRE PREPARATION & CONNECTION

1. Disconnect the power cord.
2. Connect the speaker wires to the speakers first.
3. Carefully route the wires from the speakers to the amplifier. Avoid the following potentially undesirable locations: radiator, heaters, and heating pipes — these may melt wire insulation; doorways where they are likely to be pinched or scraped, under rugs and carpets — where they are likely to be stepped on or otherwise damaged; and in contact with flammable materials.
4. Connect the free ends of the speaker lead wires to the amplifier's SPEAKERS terminals.
   i) Turn the speaker terminal cap fully counterclockwise.
   ii) Strip about 10mm (3/8 inch) of the insulation from the ends of the speaker lead wires.
   iii) If the conductor is stranded, twist the strands together so they do not come loose.
   iv) Insert the speaker lead wires into the terminal hole while observing the proper polarities, then tighten the terminal caps firmly.
   Be sure that all of the wire strands are in the terminal holes.
   v) After the wire is installed, make sure that no excess lead length is exposed and that at least 1.6mm (1/16 inch) of the insulation enters the connector assembly.
5. Re-check all wiring and connections for possible errors.

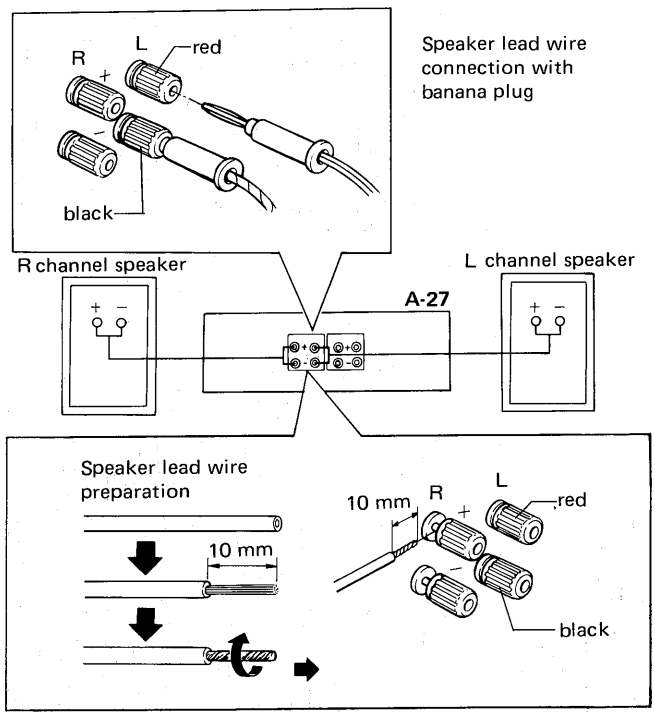


Fig. 1

TURNTABLE CONNECTIONS

Connect the output cords of a turntable to the PHONO 1 input jacks. Connect the ground lead of the turntable to the GND terminal on the amplifier.

This stereo amplifier contains a built-in amplifier for MC cartridges. This means that you can use moving coil (MC), moving magnet (MM), moving iron (MI), and induced magnet (IM) cartridges on your turntable.

NOTES:

1. *Connect your second turntable to the PHONO 2 input jacks.*
2. *If your turntable is fitted with two tonearms, the output cords for each of the tonearms should be connected to the PHONO 1 and PHONO 2 input jacks.*

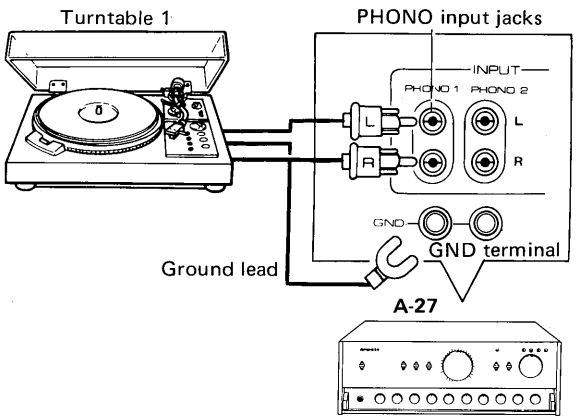


Fig. 2

TUNER CONNECTIONS

Connect the output jacks of a stereo tuner to the TUNER input jacks with the connecting cords.

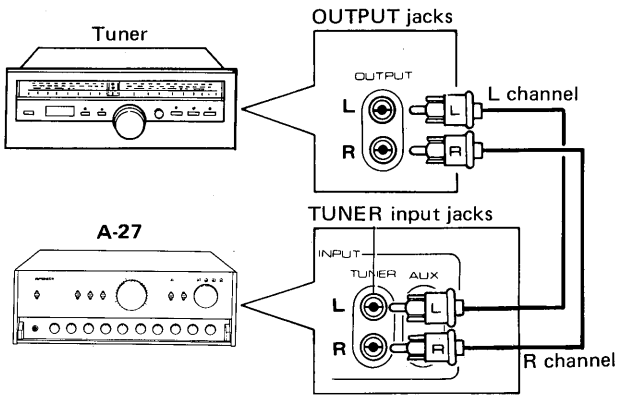


Fig. 3

AUX JACKS CONNECTIONS

You can connect an 8-track cartridge tape player, TV tuner, second tuner or tape deck playback output to these jacks (Fig. 4). Be sure to connect both left channel (L) and right channel (R) correctly.

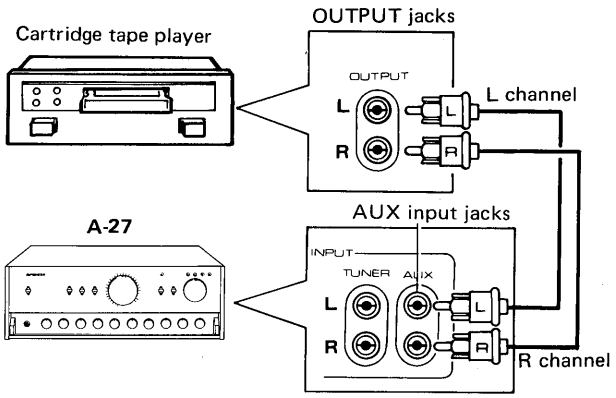


Fig. 4

TAPE DECK CONNECTIONS

The amplifier is provided with two sets of recording (TAPE REC) output jacks and two sets of playback (TAPE PLAY) input jacks. Connect each of the jacks in the following way using the connecting cords which come with the tape deck. The upper row of jacks is for the left channel (L) and the lower row for the right channel (R) (Fig. 5).

Connections for recording

Connect the recording input jacks (LINE INPUT) on the tape deck to the TAPE 1 REC jacks on the amplifier.

Connections for playback

Connect the playback output jacks (LINE OUTPUT) on the tape deck to the TAPE 1 PLAY jacks on the amplifier.

NOTE:
Connect your second tape deck to the TAPE 2 jacks (REC, PLAY).

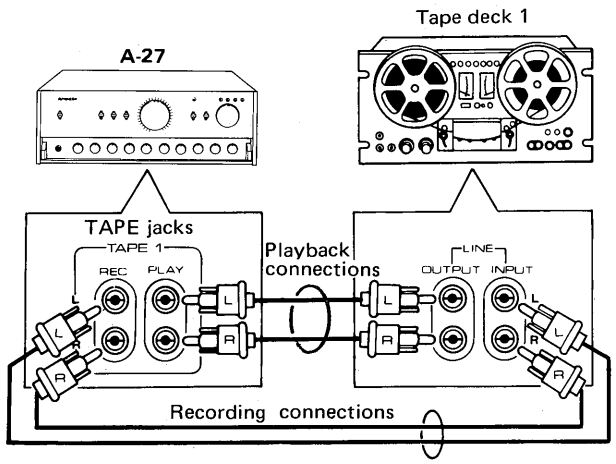
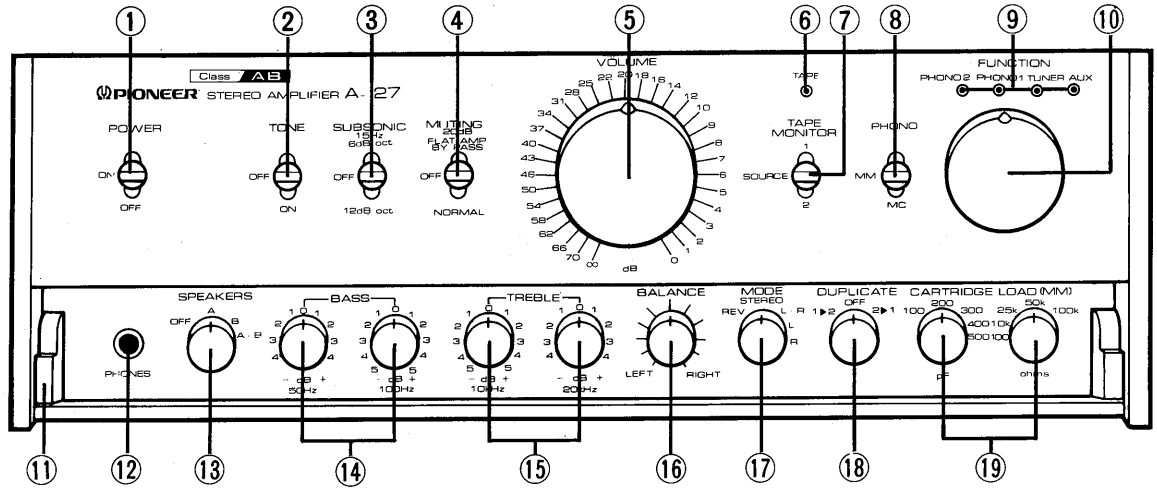


Fig. 5

FRONT PANEL FACILITIES



① POWER SWITCH

Set this switch to ON in order to supply power to the amplifier. Before switching the power on, set the VOLUME control to the ∞ position.

② TONE ON/OFF SWITCH

Set this switch to ON when adjusting the BASS and TREBLE controls. In the OFF position, it causes the amplifier to operate with a flat frequency response.

③ SUBSONIC FILTER SWITCH

Use this switch to cancel out the noise in the ultra-low frequency range generated by record warp, etc. Although you will not be able to hear this noise, it can cause cross modulation distortion and damage the speakers.

15Hz 6dB/oct. . . Set the switch to this position to attenuate frequencies lower than 15Hz by 6dB/oct. Select this position when there is relatively little noise.

OFF . . . . . Set to this position when you do not intend to use the filter.

15Hz 12dB/oct. . Set to this position to attenuate frequencies lower than 15Hz by 12dB/oct. Select this position when there is a great deal of noise.

④ AUDIO MUTING SWITCH

FLAT AMP BYPASS: When set to this position, the program source is reproduced directly without passing through the flat amplifier and tone control circuits. In cases like this, the sound will be attenuated 20dB more than the position indicated by the VOLUME control.

OFF: Keep the switch normally at this position.

NORMAL: Set to this position to attenuate the sound 20dB more than the position indicated by the VOLUME control. The tone control circuit can be worked at this position.

⑤ VOLUME CONTROL

Use this control to adjust the output level to the speakers and headphones. Turn it clockwise to increase the output level. No sound will be heard if you set it to ∞. The scale is graduated in dB which indicates the attenuation when the maximum output level is 0dB.

⑥ TAPE MONITOR LAMP

This lamp will come on when the TAPE MONITOR switch is set to position "1" or "2".

⑦ TAPE MONITOR SWITCH

Use this switch for monitoring the playback sound on a tape when using a tape deck or for monitoring the recorded sound during a recording.

1 . . . . . For monitoring the playback or recorded sound on a tape in a deck connected to the TAPE 1 jacks.

SOURCE . . . For performances from other music sources (not tapes) like records and FM broadcasts.

2 . . . . . For monitoring the playback or recorded sound on a tape in a deck connected to the TAPE 2 jacks.

NOTE:
Always set this switch to SOURCE when listening to records or broadcasts. The sound will not be heard through the speakers when the switch is set to position "1" or "2".

⑧ PHONO CARTRIDGE SELECTOR SWITCH (MM/MC)

Use this switch to select a position in line with the cartridge used on the turntable connected to the PHONO 1 or PHONO 2 jacks.

MM: Set to this position when using a moving magnet (MM), moving iron (MI) or induced magnet (IM) cartridge. The load resistance and load capacitance

can be varied using the CARTRIDGE LOAD controls.

MC: Set to this position when using a moving coil (MC) cartridge. The input impedance is 100 ohms.

⑨ FUNCTION INDICATOR LAMPS

These lamps indicate the position of the FUNCTION switch.

⑩ FUNCTION SELECTOR SWITCH

Use this switch to select the program source. The switch is coupled to the FUNCTION indicator lamps, and so the corresponding lamp will light up.

PHONO 2 . . For playing records on a turntable connected to the PHONO 2 jacks.

PHONO 1 . . For playing records on a turntable connected to the PHONO 1 jacks.

TUNER. . . . For listening to FM or AM broadcasts on a tuner connected to the TUNER jacks.

AUX. . . . . For listening to performances on another component, such as a cartridge tape player, which is connected to the AUX jacks.

NOTE:
When selecting the switch during a performance, remember to turn the volume down first.

⑪ GLASS PANEL

Push the panel down to open. To close, simply push the top of the panel up with the tip of your finger. Do not apply more force than is necessary since the panel is sensitive to heavy pressure.

⑫ HEADPHONES JACK (PHONES)

Plug the headphones into this jack when you want to listen through your stereo headphones.
Set the SPEAKERS switch to the OFF position if you want to listen to the sound through your headphones only.

⑬ SPEAKERS SELECTOR SWITCH

Use this switch to select the speaker systems.

OFF . . . Sound not obtained from speakers.

A . . . . . Sound obtained from speakers connected to the A speaker terminals.

B . . . . . Sound obtained from speakers connected to the B speaker terminals.

A+B . . . Sound obtained from speakers connected to both A and B speaker terminals.

⑭ TWIN BASS CONTROLS

Two controls for adjusting low frequency tone.

100Hz. . . Adjusts frequency band below 400Hz. +5dB to −5dB adjustment can be performed at 100Hz.

50Hz . . . Provides additional adjustment to 100Hz control for frequency band below 200Hz. +4dB to −4dB adjustment can be performed at 50Hz.

⑮ TWIN TREBLE CONTROLS

Two controls for adjustment high frequency tone.

10kHz. . . Adjusts frequency band above 2.5kHz. +5dB to −5dB adjustment can be performed at 10kHz.

20kHz. . . Provides additional adjustment to 10kHz control for frequency band above 5kHz. +4dB to −4dB adjustment can be performed at 20kHz.

⑯ BALANCE CONTROL

Use this control to adjust stereo balance between the left and right speaker systems or headphones. Turn it clockwise from center to increase right channel volume and counter-clockwise from center to increase left channel volume in order to obtain a balance.

⑰ MODE SWITCH

Use this switch to select stereo and mono performances.

REV. . . . . For reversing the left and right channels of the stereo input signals.

STEREO . . . For normal stereo performances.

L + R . . . . . For mixing the left and right channel stereo signals and for mono performances through both the left and right speakers.

L . . . . . For mono performances whereby the left channel stereo signals are reproduced through the left and right speakers.

R . . . . . For mono performances whereby the right channel stereo signals are reproduced through the left and right speakers.

⑱ TAPE DUPLICATE SWITCH

Select a position with this switch when using two tape decks to duplicate recorded tapes or edit tapes. This switch is otherwise kept at the OFF position.

1▶2. . . . For playing back the tape on a deck connected to the TAPE 1 jacks and recording (duplicating) on a deck connected to the TAPE 2 jacks.

OFF . . . . Set to this position when not duplicating.

2▶1. . . . For playing back the tape on a deck connected to the TAPE 2 jacks and recording (duplicating) on a deck connected to the TAPE 1 jacks.

⑲ CARTRIDGE LOAD (MM) SELECTOR SWITCHES

These switches are used to select the input resistance (ohms) and input capacitance (pF) in accordance with the designated values of the moving magnet (MM) cartridge which you are using on your turntable. For further details, refer to page 12. These switches will not work when the cartridge selector switch is set to MC.

OPERATIONS

PRIOR TO SWITCHING POWER ON

Before switching the power on, set the various controls as follows:

1. Set the TONE switch to OFF.
2. Set the SUBSONIC switch to OFF.
3. Set the MUTING switch to OFF.
4. Set the VOLUME control to ∞.
5. Set the TAPE MONITOR switch to SOURCE.
6. Set the DUPLICATE switch to OFF.
7. Set the MODE switch to STEREO.
8. Set the BALANCE control to the center position.
9. Set the BASS and TREBLE controls to the center position.
10. Set the SPEAKERS switch to the appropriate position according to the employed terminals.

PLAYING RECORDS

1. Set the FUNCTION switch to PHONO 1 when your turntable is connected to the PHONO 1 jacks. Set to PHONO 2 when the turntable is connected to the PHONO 2 jacks.
2. • Set the PHONO MM/MC switch to MM (upper position) when using a moving magnet (MM) cartridge. Then set the CARTRIDGE LOAD controls in accordance with the cartridge's specified load resistance and load capacitance. (For further details, refer to "LOAD RESISTANCE AND LOAD CAPACITANCE" on page 12).
   • Set the PHONO MM/MC switch to MC (bottom position) when using a moving coil (MC) cartridge. You will not be able to vary the load resistance and load capacitance even if you rotate the CARTRIDGE LOAD controls.
3. Operate the turntable to play the record.
4. Adjust the volume with the VOLUME control.
5. To adjust the tone, first set the TONE switch to ON, and then adjust the BASS and TREBLE controls for the preferred bass and treble levels.

Precautions when playing records.

- Lower the stylus gently onto the surface of the record. It is a good idea to set the MUTING −20dB switch to the NORMAL position or to turn the volume down when lowering the stylus onto the record.
- Set the SUBSONIC switch to 6dB/oct or 12dB/oct when there is a great deal of noise in the low-frequency region or when the bass speaker's diaphragm moves even though no sound can be heard during a performance.
- Do not cause the turntable to vibrate while a record is being played since this will cause the stylus to jump and scratch the record. Do not turn off the power if the stylus is still tracing grooves on the record.

LISTENING TO THE BROADCAST

1. Set the FUNCTION switch to TUNER.
2. Operate the tuner and tune in to the desired station.
3. Adjust the volume with the VOLUME control.
4. To adjust the tone, first set the TONE switch to ON and then adjust the BASS and TREBLE controls for the preferred bass and treble levels.

USING THE AUX JACKS

1. Set the FUNCTION switch to AUX.
2. Operate the audio component which you have connected to the AUX jacks.
3. Adjust the volume with the VOLUME control.
4. To adjust the tone, first set the TONE switch to ON and then adjust the BASS and TREBLE controls for the preferred bass and treble levels.

Protection circuitry

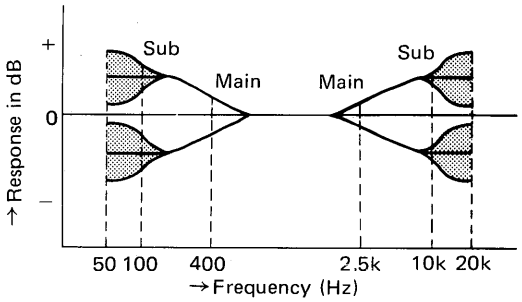
- No sound will be heard from the speakers for about 10 seconds after the power has been switched on. This is due to the built-in muting circuit which eliminates unpleasant noise generated when the power is switched on, and the relay-combined protection circuits which prevent the speakers from being damaged when DC components enter the output.
- When the sound from the speakers suddenly stops during a performance, it may mean that the speaker jacks have been shorted or that there is an overload (if you are using speakers with an impedance of under 4 ohms). In such cases, the high-speed overload detecting protection circuitry will be actuated at a moment's notice and the output-stage transistors will be protected from possible damage. The protection circuitry resets itself automatically, so that normal operation is resumed as soon as the fault is corrected.

EFFECTIVE OPERATIONS

TWIN BASS AND TREBLE TONE CONTROLS

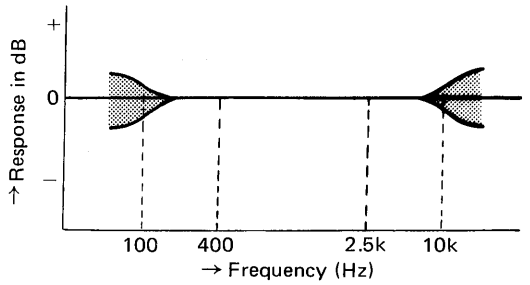
Adjust each of the controls for the following sound effects.

Using only the main controls (BASS: 100Hz, TREBLE; 10kHz) provides the same function as conventional audio tone controls. Employing the sub-controls (BASS: 50Hz, TREBLE; 20kHz), however, has the same effect as changing the turnover frequencies. The combined operation of both controls will produce a broad range of tone variations as shown in Fig. 6 & 7.



Adjusting first the main, then the sub controls can provide the range of adjustment shown by the shaded areas in the figure.

Fig. 6

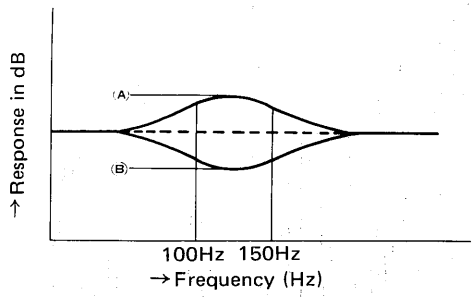


With BASS and TREBLE main controls set at 0dB, adjustment range of the sub-controls will be as shown by the shaded areas in the figure.

Fig. 7

Examples of effective operation

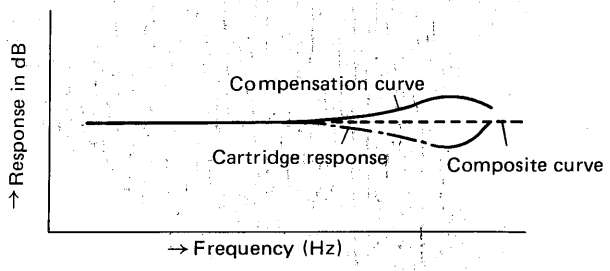
- If the BASS controls are adjusted as in Fig. 8, low frequencies in the 100Hz — 150Hz region, which delicately influence the bass impression, can be enhanced. While retaining an overall flat impression, slightly more weight can be obtained in the low frequency band (A). Since the opposite adjustment can also be preformed, it is possible to improve such effects as standing waves and extended reverberations, which can occur in reinforced steel framework buildings and create an unnatural effect (B).



Adding slight body to low frequencies

Fig. 8

- High frequencies can be adjusted with the twin TREBLE controls to compensate for the quavering that often occurs with moving magnet (MM) cartridges and to obtain a reproduced sound with a completely flat response. To cite another example, when conventional tone controls are used to enhance high frequencies from records, ultra high frequency peaking can occur from the cartridge. This drawback is eliminated by the twin control system which can enhance 8kHz — 10kHz frequencies while maintaining an overall flat response.

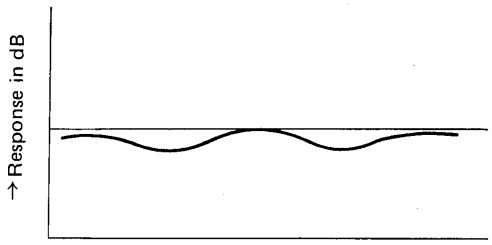


Compensation for cartridge high frequency "hollowness"

Fig. 9

NOTE:
You can use the CARTRIDGE LOAD switches to compensate for the frequency response at the high-end of MM cartridges. For further details, refer to "LOAD RESISTANCE AND LOAD CAPACITANCE" on page 12.

- Fig. 10 shows an example of where the adjustment of the BASS and TREBLE controls together can have the relative effect of enhancing the mid-range. This is effective in producing an audio "close-up" of a singer's voice.



Relatively enhancing the mid-range

Fig. 10

TONE SWITCH

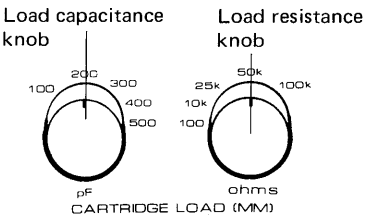
Regardless of the twin tone control settings, a completely flat response can be obtained at any time by setting the TONE switch to OFF. The delicate effects of the tone controls and their optimum adjustment according to different program sources can then be evaluated.

LOAD RESISTANCE AND LOAD CAPACITANCE

Typical moving magnet (MM) cartridges have resonance peaks at high frequencies, as shown in Fig. 12. However, the height of the peaks can be varied by changing the load resistance (ohms). The peaks increase as the resistance is increased. In addition, the resonance frequency (center of the peak frequency) can be varied by changing the load capacitance (pF), as shown in Fig. 13. If the capacitance is increased, then the resonance frequency is lowered and the peaks are increased. To provide the best characteristics of your cartridge, set the "pF" and "ohms" switches, following the instructions outlined belows. By combining these two knobs, you will be able to obtain a variety of different high-frequency responses.

When the phono cartridge load resistance and capacitance are specified

- Set the specified load resistance with the "ohms" knob.



CARTRIDGE LOAD (MM) switches

Fig. 11

- Subtract the turntable capacitance (stray capacitance (stray capacitance of the output cord, tonearm, etc.) from the cartridge's specified capacitance and select this value with the "pF" knob.

NOTES:

- *Refer to the operating instructions of the cartridge for the specified load resistance and capacitance values.*
- *Since the turntable capacitance varies with the output cord, wiring and other factors, a precise value cannot be definitely determined. In general, however, it can be considered to be in the range of 100pF to 200pF. Adjust the load capacitance while listening to a record.*

Table 1 — Makes of cartridges and recommended loads

Cartridge		Load resistance (ohms)	Load capacitance (pF)
Manufacturer	Power generating type		
Pioneer	PC-550E/II (MM)	47k	170
ADC	XLM MKII (IM)	47k	275
AKG	P8E (MI)	47k	400
Empire	2000Z (MI)	47k	300
Ortofon	VMS20E (MI)	47k	400
Shure	V15 TYPE III (MM)	47k	400–500
Stanton	680 EE (MI)	47k	275

NOTE:
The capacitance of Pioneer's turntables ranges from 75pF to 150pF. Subtract the capacitance from the load capacitance shown in the table, and then set the switch to the value which is closest to the resulting figure.
For example, say you are using the PC-550E/II by Pioneer. Subtract 100pF from 170pF which gives 70pF. Set the CARTRIDGE LOAD switch to the closest figure, which is "100"(pF).

When not specified

The example in Fig. 13 shows typical high-end frequency curves. In a case like this, adjust both knobs for the desired response while listening to a record. With ordinary MM cartridges, the values are 50 kilohms and 100pF — 200pF.

Examples of frequency response variations due to CARTRIDGE LOAD ohms switch settings.

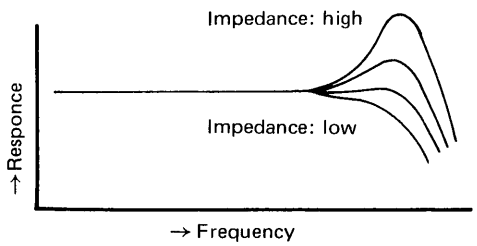


Fig. 12

Examples of frequency response variations due to pF switch settings.

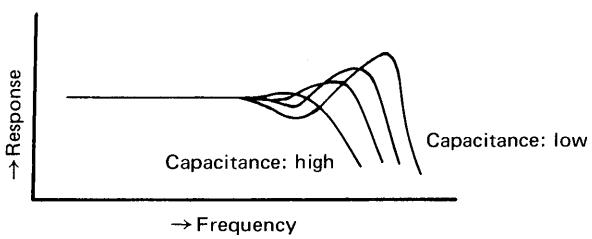


Fig. 13

VOLUME CONTROL AND MUTING SWITCH

The VOLUME control is calibrated in dB units for direct readout.

By adjusting it in combination with the MUTING switch, it is possible to adjust the attenuation more finely across a very wide range.

When the MUTING switch is set to FLAT AMP BYPASS or NORMAL, the volume will be attenuated 20dB more than the position indicated by the VOLUME control. You will achieve good results if the FLAT AMP BYPASS and NORMAL positions are selected in accordance with the applications described below.

Using the FLAT AMP BYPASS position

You will not be able to adjust the volume. However, the sound will bypass the flat amplifier and tone control circuits for a clearer sound quality.

Set the switch to this position when you do not want to adjust the sound quality and when a high volume output is not required. Then adjust the sound with the VOLUME control.

Using the NORMAL position

- There will be no need to adjust the VOLUME control every time you change over a tape or record if you set the switch to this position for reducing the volume temporarily during play.
- You will not be able to finely adjust the volume if the VOLUME control is near the ∞ position when listening to a program at a low sound level at night, for example. In such cases, set the MUTING switch to NORMAL and you will then be able to adjust the sound with the VOLUME control to more fine steps.

NOTE:
Always turn the VOLUME control right down when returning the MUTING switch to OFF during a performance when the sound is set to a high level with the VOLUME control.

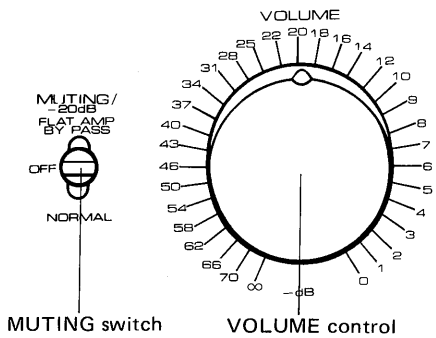


Fig. 14

USING THE TAPE DECKS

PLAYBACK

Proceed as follows when playing back pre-recorded music tapes available on the open market, and tapes on which you have recorded programs.

1. As shown in Fig. 15, set the TAPE MONITOR switch to 1 if the tape deck is connected to the TAPE 1 jacks. Set the TAPE MONITOR switch to 2 if it is connected to the TAPE 2 jacks.
2. Operate the tape deck controls for playback.
3. Adjust the volume with the VOLUME control.
4. To adjust the tone, first set the TONE switch to ON, and then adjust the BASS and TREBLE controls for the preferred bass and treble levels.

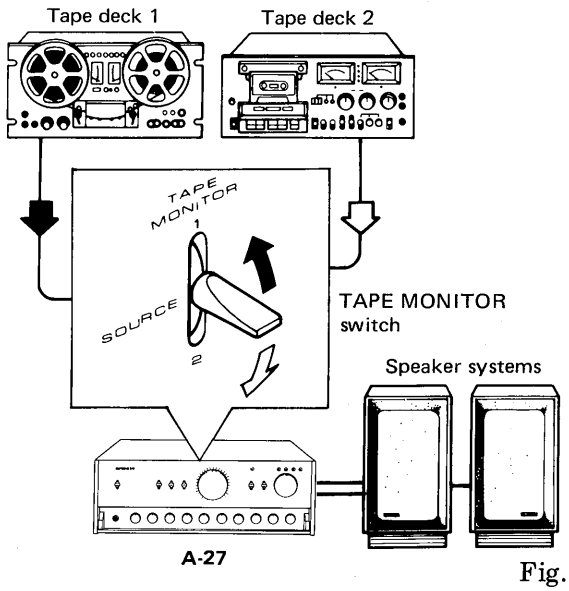


Fig. 15

NOTES:
1. *Always set the TAPE MONITOR switch to the SOURCE position when you are not playing back a tape.*
2. *As long as the TAPE MONITOR switch is at 1 or 2, you will be able to playback a tape regardless of the setting of the FUNCTION switch.*

RECORDING

1. Set the FUNCTION switch to the program source to be recorded.
2. Set the DUPLICATE switch to the OFF position.
3. Set recording level by means of the controls on the tape deck.
4. Operate the tape deck controls and start recording.

NOTES:
1. *When recording, keep the MODE switch at STEREO.*
2. *The amplifier's VOLUME, BASS, and TREBLE controls have no affect on the recorded sound when a recording is being made.*

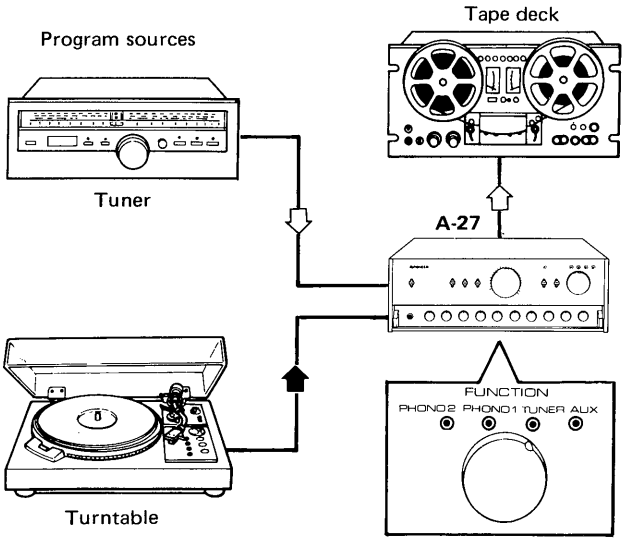


Fig. 16

Tape monitoring

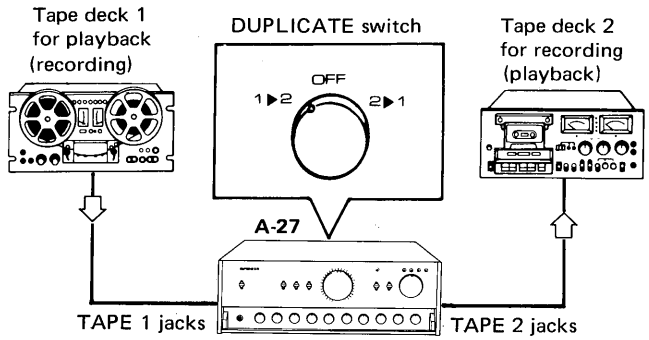
If a recording is being made on a 3-head tape deck, the recorded sound can be monitored through the speaker systems if the TAPE MONITOR switch is set to 1 or 2. In this case, both recording and playback connections must be made.

NOTE:
If you have a 2-head open-reel deck or cassette deck, you will not be able to monitor the recorded sound even if you set the TAPE MONITOR switch to 1 or 2. However, you will be able to hear the sound at the playback end (program source).

DUPLICATING AND EDITING RECORDED TAPES

1. Connect the two tape decks as illustrated in Fig. 17.
2. When duplicating the contents of a recorded tape in tape deck 1 onto a blank tape in tape deck 2, set the TAPE DUPLICATE switch to 1 ▶ 2. When duplicating from deck 2 to deck 1, set this switch to 2 ▶ 1.

When you want to monitor the quality of the sound being recorded, set the TAPE MONITOR switch on the playback tape deck to "1" or "2".

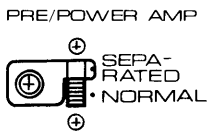


Set the DUPLICATE switch to 1 ▶ 2 when recording from tape deck 1 to tape deck 2.

Fig. 17

USING THE PRE OUT, POWER AMP IN JACKS

As explained below, you can use the preamplifier and power amplifier of the A-27 separately if you set the PRE/POWER AMP switch on the rear panel (FIg. 18) to SEPARATED. When using the A-27 as an integrated amplifier, keep this switch at the NORMAL position.



Loosen the screw, remove the stopper and set the switch to the suitable position.

Fig. 18

INDEPENDENT PREAMPLIFIER SECTION

As shown in Fig. 19, you can connect a high output power stereo amplifier or a home-built power amplifier to the PRE OUT jacks and compare the sound with the power amplifier section of the stereo amplifier.

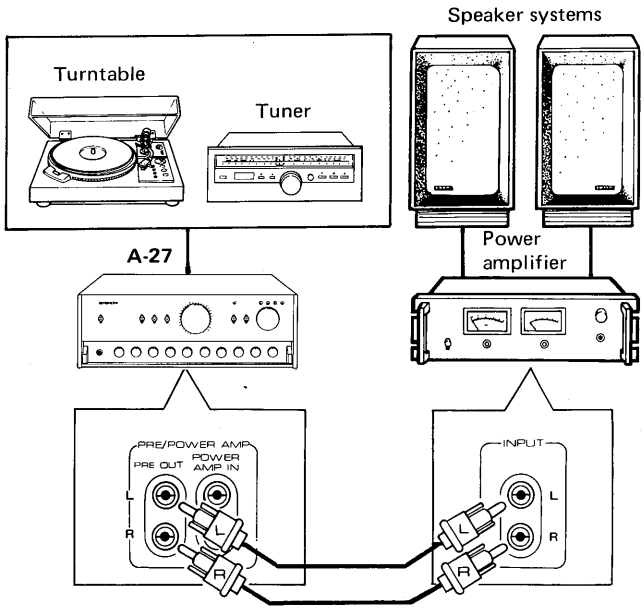


Fig. 19

INDEPENDENT POWER AMPLIFIER SECTION

As shown in Fig. 20, you can connect a stereo preamplifier which you may have to the POWER AMP IN jacks and compare your own stereo system.

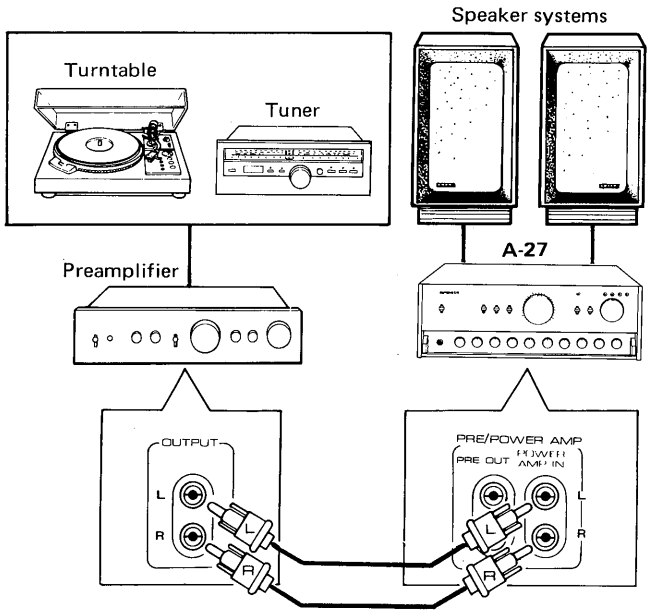


Fig. 20

COMPOSING A MULTI-AMPLIFIER SYSTEM

As shown in Fig. 21, you can compose your own multi-amplifier system if you connect an optional stereo power amplifier and crossover network. A multi-amplifier system splits up the audible frequency range into different frequency bands. Each of these bands is then amplified by the amplifiers and so this has the advantage of reducing intermodulation distortion.

Two-way multiple amplifier system

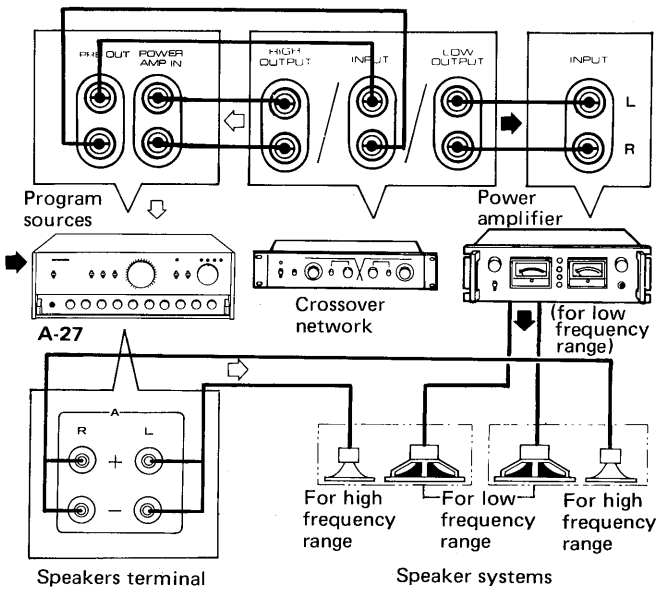


Fig. 21

HEX. WRENCH

The accessory hexagonal wrench is provided for removing the VOLUME knob or tightening its set-screw should it become loose.

If required, loosen the set-screw by inserting the wrench into the hole on the side of the knob and turning the wrench counter-clockwise.

Be particularly careful not to scratch the front panel when employing the wrench.

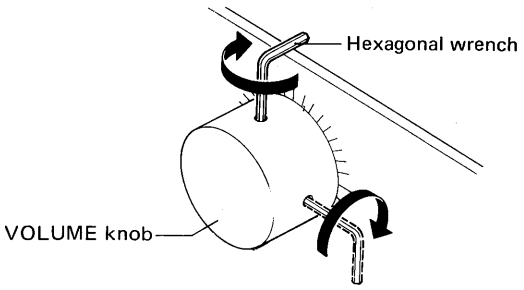
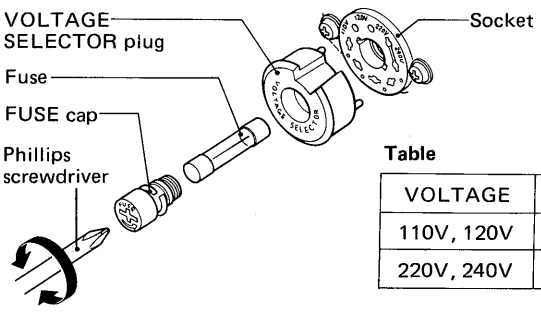


Fig. 22

ADJUSTING THE LINE VOLTAGE SELECTOR SWITCH

This amplifier provides a line voltage selector switch on the rear panel to use it in location 110V, 120V, 220V or 240V. Before your amplifier is shipped from the factory, the switch is set to the power requirements of the destination, although you should check that it is set properly before plugging the power cord into the outlet. If the voltage is not properly set or if you move to an area where the voltage requirements differ, adjust the selector switch as follows:

1. Disconnect the power cord.
2. Use a Phillips screwdriver to unscrew the fuse cap, then take out the fuse and VOLTAGE SELECTOR plug.
3. Re-install the plug with its cutaway section exposing the correct voltage indication as shown in Fig. 23.
4. Refer to the table and install a replacement fuse (provided as an accessory).
5. Insert the fuse in the fuse cap, then fit the cap to the plug and tighten.



Table

VOLTAGE	FUSE
110V, 120V	12A
220V, 240V	6A

Fig. 23

CONDITIONS FREQUENTLY MISTAKEN FOR MALFUNCTION

In event of suspected malfunction, check the unit according to the following table and confirm proper operation of other connected equipment. If the difficulty cannot be corrected, turn off the power and contact a Pioneer authorized service center.

Symptom	Diagnosis checkpoints	Remedy
No sound	• Is pilot lamp on?	• Plug power cord securely into power outlet. • Set POWER switch to ON.
	• Are speakers, tuner, tape deck and other components connected properly?	• Connect properly. (If all components are connected properly, check the components themselves).
	• Check PRE/POWER AMP switch position on rear panel	• Set to NORMAL.
	• Is FUNCTION switch set to correspond to program source?	• Set so that the switch corresponds to the source.
	• Check TAPE MONITOR switch position.	• Set to SOURCE except for tape playback. Refer to page 8.
	• Check SPEAKER switch position.	• Select in accordance with the speaker jacks to which speakers are connected.
	• Check positions of MUTING switch and VOLUME control.	• Set MUTING switch to OFF, and rotate VOLUME control clockwise.
	• Sound not heard immediately even though POWER switch is set to ON.	• Sound will not be heard for several seconds due to actuation of the muting circuit. See page 10.
Occasional noise heard.	• Are components conected properly?	• Connect so as to eliminate faulty contacts. (Noise may decrease when ground wire is connected.)
	• Any problems with connected components?	• Correct fault.
Sound quality remains unaltered.	• Check positions of TONE and MUTING switches.	• Set TONE switch to ON and MUTING switch to OFF or to NORMAL.
Howl caused when volume is raised.	• Turntable and speakers are too close to one another.	• Try changing the installation locations of the turntable and speakers.
	• Installation locations of turntable and speakers are not stable.	• Do not turn up the BASS controls excessively.

PIONEER ELECTRONIC CORPORATION
4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
U.S. PIONEER ELECTRONICS CORPORATION
85 Oxford Drive, Moonachie, New Jersey 07074, U.S.A.
PIONEER ELECTRONIC (EUROPE) N.V.
Luithagen-Haven 9, 2030 Antwerp, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD.
178-184 Boundary Road, Braeside, Victoria 3195, Australia
Printed in Japan
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